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National Research Council Reports on Fluoridation

This committee was convened and directed to express its judgment as to whether, on a basis of a review of the present status of scientific knowledge, supplementing the fluoride content of public water supplies for the *partial* prevention of dental caries is a desirable and safe procedure from a physiological viewpoint. Specifically, it has been advocated, where necessary because of the deficiency of this element, that the fluoride content of the public water supplies be adjusted to insure a mean content of approximately 1 p.p.m. of fluorine. While some aspects of water fluoridation are still in the experimental stage, its application has been shown to be technologically practical and economically feasible. However, it remains to be determined by each municipality contemplating installation of this procedure (1) what benefits may be expected, and (2) what the potential liabilities are. After reviewing the available evidence, your committee believes that the following are the principal considerations, briefly stated, upon which judgment must be based.

On November 29, 1951, a special study committee of the National Research Council, Division of Medical Sciences, made its report on fluoridation. This report, which lends further scientific endorsement to the addition of fluorides to public water supplies as a way of reducing dental decay, is reprinted here in its entirety.

fluorine as fluorides. A number of supplies (Hill and others, 1949), particularly those obtained from deep wells and aquifers irregularly distributed in various parts of the Country, contain from 1.5

p.p.m. up to 7 or 8 p.p.m., very rarely more.

2. From the epidemiological investigations of Dean (1946), there is convincing evidence that within certain limits there is an inverse relationship between the natural fluoride content of drinking water and the frequency of dental caries in children dependent upon these supplies. The most useful index of the amount of caries is the number of decayed, missing and filled permanent teeth (DMF) per child, per 100 children, or per 100 permanent teeth, at specified ages. Dean's original observations were based upon 7,257 selected white school children aged 12-14 in 21 cities of four states. The prevalence of caries (DMF) was greatest in those children who had used continuously from birth the public water supplies which were fluoride-free. The prevalence was progressively less in comparable children reared in cities with public water supplies having a fluoride content up to approximately 1 p.p.m. Beyond this concentration there was little, if any, advantage. Children reared in cities where drinking water contained approximately 1.0 p.p.m. of fluorine experienced only about one-third as much dental caries as those reared in cities whose water supplies were fluoride-free (Dean, 1949). These basic observations have been confirmed and extended by investigators in this and other countries.

3. The caries-preventive effect of adequate fluoride intake is principally conferred upon children when the dentine and enamel of the permanent dentition are

1. *Under normal conditions of living, fluorine is a trace element in human nutrition* (McClure, 1951). Minute amounts are absorbed from certain foods and drinking water and, to a limited extent, are retained by dental and osseous tissues. The quantity of fluorine ingested in food is a relatively unimportant variable; the average diet contains 0.2 to 0.3 mg. daily. *Of greater import is the variable quantity ingested in drinking water.* Many of the public water supplies in the United States, particularly those of the large cities, derived from rivers, lakes, and ponds, are practically fluoride-free; others contain from traces to 1.5 p.p.m.

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being formed, i.e., from birth up to about the twelfth year. There is evidence that this increased resistance to dental caries is carried over to some extent into later life, so that at least there is a delay of several years in the incidence of caries (Forrest, 1951). A recent detailed epidemiological study of adult populations (Russell and Elvove, 1951) considerably extends knowledge in this field. These observations show that marked caries-inhibitory effects of fluoride waters are operative in the 35-39- and 40-44-year-old groups.

4. A considerable number of experimental studies have been conducted in the laboratory to explore the inhibition of induced experimental caries in rats and hamsters by fluorides and to explain this action. The results give consistent support to the concept of a relationship between human caries and fluorides (McClure, 1951). While it appears probable that caries resistance is associated with the incorporation of fluorides into the tooth structure, the exact mechanism by which it is mediated is unknown. The causes of caries are only partially understood.

5. The margin between the optimal quantity of fluoride in drinking water which is required for maximal benefit in tooth development and the amount which produces undesirable physiological effects is sufficiently wide to cause no concern. The most sensitive indication of the latter is the enamel defect of the permanent teeth known as endemic fluorosis, or mottled enamel. The epidemiological studies of Dean (1942), based upon examination of 5,824 white children in 10 states, showed a direct correlation between severity of the manifestations of mottled enamel and the increasing fluoride content (up to 5 p.p.m.) of the water supplies upon which they were dependent. At approximately 1.0 p.p.m., less than 10 percent of children show the least detectable evidence of disturbances in enamel formation, which are not visible except to the trained eye of the examining dentist. Beginning at about 2 p.p.m., an increasing proportion of children have mottled enamel of a grade that is easily apparent. While such teeth are caries-resistant, they are esthetically objectionable.

6. While the safe level of fluoride concentration to afford a maximum caries-preventive effect without mottled enamel is approximately 1.0 p.p.m., it varies somewhat with climatic and other factors and must be ascertained for each general area (Dean, 1951). For practical public health purposes, it has been proposed that a safe level has been reached when not more than 10 to 15 percent of children age 12-14 years, who have used water supplies since birth, and who have been examined under standard conditions, show the mildest detectable type of mottled enamel. Under the climatological conditions prevailing in the Chicago area, where

the mean annual temperature is about 49° F., this upper limit has been reached by domestic water supplies containing approximately 1.0 to 1.5 p.p.m. fluoride. On the other hand, in the vicinity of Moultrie or Brunswick, Georgia, with a mean annual temperature of 68° F., the upper level has been found to be associated with water supplies containing only 0.5 to 0.7 p.p.m.

7. There is an extensive literature on the pharmacology and toxicology of fluorine and its compounds. This has been reviewed by several authors (McClure, 1946; Cox and Hodge, 1950; Heyroth, 1951; Smith, 1951). Only those parts of it which deal with the cumulative action of fluorides are pertinent to the question of the safety of fluoridation. Chronic fluoride intoxication characterized by bone, joint, and other tissue changes has been the cause of impaired skeletal function in Danish workmen exposed to fluoride dusts as an occupational hazard (Roholm, 1937). The presence of concentrations of fluorides in excess of 5 p.p.m. in water supplies in certain parts of the world has been reported to have given rise to a number of cases of chronic fluorosis, but the reported data are inadequate to establish the threshold concentration at which storage may be expected to occur to a potentially harmful extent. A radiologic survey at Bartlett, Texas, where the water contains 8 p.p.m., revealed an increased bone density not associated with functional impairment in 11 percent of those examined (Dean, 1944), but roentgenologic examinations of a limited number of persons living in areas where the water contained from 1.2 to 3 p.p.m., revealed no evidence of fluorosis (Hodges and others, 1941).

The fluoride concentrations in the urine of normal teen-age boys and young men closely approximate numerically those in their drinking water in regions where the water supplies contain from 0.2 to 4.7 p.p.m. (McClure, 1946). Fluorine balance studies furnish additional evidence that the human body eliminates the major portion of food- and water-borne fluoride when the quantities ingested do not exceed 4.0 to 5.0 mg. of fluoride daily (McClure, 1951), although the daily ingestion of 6.0 mg. led to demonstrable storage (Machle and Largent, 1943).

In the accumulated experience there is no evidence that the prolonged ingestion of drinking water with a mean concentration of fluorides below the level causing mottled enamel would have adverse physiological effects. Since the water supplies in various parts of the Country contain considerably greater amounts, it is desirable that epidemiologic surveys of the incidence of chronic fluorosis be made in those regions, and that further balance studies be undertaken in order to establish the facts in regard to the storage of fluoride at moderately elevated levels of intake.

8. In 1945, studies were begun to ascertain whether the adjustment of the fluoride content of a public water supply to the optimal level with commercially available fluorides would confer the same caries-inhibitory effects as do waters which carry the same concentrations of fluoride naturally.

Preliminary analysis of the first four years is now available on two studies in which the observations were carefully controlled: (1) the Grand Rapids, Muskegon, Aurora study (Dean and others, 1950); (2) the Newburgh, Kingston study (Ast and others, 1950-51).

Beginning in January, 1945, sodium fluoride was added to the Grand Rapids water supply in sufficient quantities to insure continuous maintenance of a level of about 1 p.p.m. In order to establish a base line of dental caries experience prior to fluoridation, 19,680 children with history of continuous residence in Grand Rapids, Michigan, were given a complete dental examination. In addition, 4,291 children were examined in Muskegon, Michigan, a city which derives its fluoride-free water supply from the same source as does Grand Rapids, i.e., from Lake Michigan. An additional 5,116 children were examined in Aurora, Illinois, where the community water has contained 1.2 p.p.m. of "natural fluoride" for years. Data from examinations conducted at Grand Rapids and Muskegon during the autumn of each year since 1945, i.e., five yearly examinations since fluoridation was begun, have been tabulated. These examinations were made on representative children from the kindergarten, first, fourth, eighth and eleventh school grades. In Grand Rapids, there has been a reduction in caries experience in the permanent teeth of children examined in 1949 as compared with the rate expected on the basis of the 1944-45 examinations, particularly in the younger ages. The apparent amount of reduction in the DMF rate per child at ages 6, 9, 13 and 16 years, was approximately 51 percent, 36 percent, 17 and 12 percent, respectively. Concurrently, there has been a slight decline in the caries rates reported by Muskegon with its fluoride-free water supply but it is relatively small and inconsistent, 22 percent in the six-year-olds and 28 percent in the seven-year-olds. This is unexplained. In the 5-, 6- and 7-year-old groups at Grand Rapids the DMF rates now approximate those of comparable groups of children in Aurora. Preliminary analyses of the 1950 dental examinations at Muskegon and Grand Rapids indicate that the observed dental caries experience at Muskegon is again similar to that recorded in the 1944-45 base line. At Grand Rapids a further reduction in dental caries prevalence was observed.

In another study, beginning in May, 1945, sodium fluoride was added to the water supply of Newburgh, New York, so as to provide a content of 1.2 p.p.m.,

while the Kingston, New York, supply was, and has continued to be, fluorine free. At the end of four years of fluoride treatment of Newburgh's water supply, analysis has been made of the data on dental caries experience both of deciduous and permanent teeth of approximately 3,200 school children 5 to 12 years old in Newburgh, and 3,100 children of the same age in Kingston. In brief, the investigators conclude that the DMF rates among permanent teeth of the 6- to 12-year-old children in Newburgh show a consistent downward trend after four years of fluoridation, whereas the DMF rates in the control city of Kingston show no changes. The reduction in Newburgh is from 20.6 DMF per 100 permanent teeth to 13.9, or a reduction of 32.5 percent. The rate in Kingston remained at 20.2 DMF per 100 permanent teeth. Since the first permanent molars are the teeth most affected by dental caries, a special analysis of the condition of these teeth was made. The number of caries-free first permanent molars increased in Newburgh, after four years of fluoride exposure among 6- to 9-year-old children, from 59 per 100 molars to 77. The number of caries-free permanent teeth among Kingston children of the same age remained essentially unchanged.

From these two studies, therefore, it appears that the adjustment of the fluoride concentration to optimal amounts in a water supply previously deficient in this element has resulted in considerable reduction of caries in children. Just how great a reduction may be effected ultimately will have to wait upon a longer period of observation. Reports from other cities which have installed this procedure tend to corroborate the studies mentioned (Hutton and others, 1951; Bull, 1949-50; Erlenbach and Tracy, 1946, 1948; Hill and others, 1950). Continued observations, however, are essential to establish the degree of effectiveness in higher age groups.

9. In the control studies to which reference was made in the preceding paragraph, sodium fluoride (NaF) was added to the water supplies. Assuming that the availability of fluoride ion is the same, the use of sodium silicofluoride (fluosilicate) (Na_2SiF_6) should result in considerable savings. On the basis of experimental studies, the fluorine in sodium fluoride and sodium fluosilicate produce similar physiological effects upon rats (McClure, 1950) and are equally effective in inhibiting the development of induced dental caries in rats (Zipkin and McClure, in press). Accordingly, it is inferred that this would apply to human experience as well, although this has not yet been demonstrated. Other considerations being equal, for reasons of economy the cheaper material (fluosilicate) is recommended. In the case of smaller public water supplies, however, other factors, such as available space,

handling hazards, and equipment preference, will determine the choice of the compound used.

10. The statement that fluoridation of water supplies reduces tooth decay 65 percent is postulated on an expectancy for a population using a fluoride-free water supply. When a public water supply naturally containing 0.4 to 0.5 p.p.m. of fluoride is adjusted to the optimal level (1.0 p.p.m.), the reduction in dental caries prevalence obviously would be less. Upon the basis of information at present available, it is not possible to predict how much reduction of caries will be apparent in the adult population. *Other factors—genetic, dietary, bacteriologic, and the availability of dental services, etc.—affect the prevalence of caries and vary in every community. Fluoridation is a partial caries control procedure and does not eliminate the need for other dental health measures.*

11. The promotion, initiation, supervision, and proper operation of the fluoridation of public water supplies is a responsibility of the State Department of Health, acting jointly through its bureau or division of dental health and through the division of public health engineering with the collaboration of the dental and medical professions. Suitable local plans for dental health surveys before fluoridation and periodic evaluations should be set up by the dental public health program director. These surveys should provide data suitable for calculating an index of caries attack and an index of the frequency and severity of dental fluorosis (mottled enamel). Engineering aspects of fluoridation, such as tests to determine the fluoride content of the water, safety provisions, training of operators, etc., should be covered by state regulations. The statement of policy and procedure formulated by the American Water Works Association (1949) will be acceptable to most state departments of health. Municipalities contemplating the installation of fluoridation should look to the state health department for expert guidance. Many small communities would be unable to maintain satisfactory fluoridation practice without assistance. There are many so-called automatic plants applying chlorination which allegedly do not require full-time attendance of a water works operator. Many have very limited laboratory facilities, or lack technical personnel to make accurate chemical determinations of fluoride content. Ultimately, state or regional laboratories will have to take over routine chemical examination of samples along with established bacteriological control. Provision for periodic visits by a state sanitary engineer cannot be considered adequate supervision.

Summary and Conclusions. Under normal conditions of living, fluorine is a trace element in human nutrition. A variable and important source is drinking

water. Many of the public water supplies in the United States are deficient in this element. Children dependent upon such supplies have a high dental caries attack rate as compared with children living in cities having water supplies containing about 1.0 p.p.m. of fluoride. The advantage of the latter group is considerable and is of the order of one-third to one-half as much caries. The caries-preventive effect of adequate fluoride intake is principally conferred upon children up to about the twelfth year of life, during the period when dentine and enamel of the permanent dentition are being formed. This increased resistance to dental caries is carried over into later life to an appreciable degree. The results of experimental studies conducted in the laboratory give consistent support to the concept of the inhibitory effect of fluoride on the caries process. There is a safe margin between trace quantities in drinking water which are required for optimal dental health and that amount which produces undesirable physiological effects. The most sensitive indication of the latter is interference with normal calcification of the teeth, which is manifested in mottled enamel, or endemic fluorosis. This effect, although compatible with caries-resistant tooth structure and, within certain limits, apparently with physiological well-being, is esthetically undesirable. The level of fluoride concentration in drinking water which is associated with the appearance of mottled enamel varies with individual susceptibility and with the amount of water consumed. The upper level of safety has been reached in the northern part of the United States in domestic water supplies containing approximately 1.0 to 1.5 p.p.m. fluorine, in the southern part of the Country approximately 0.7 p.p.m. There is no reason to believe that prolonged ingestion of drinking water with a mean concentration below the level causing mottled enamel will have an adverse physiological effect. Progress reports in several communities in which sodium fluoride has been added to the water supplies of low fluoride content indicate that this procedure will reduce the caries attack rate in children. There is evidence to suggest that it will confer an appreciable measure of protection to teeth of adults.

In view of these considerations, your committee recommends that any community which includes a child population of sufficient size, and which obtains its water supply from sources which are free from or are extremely low in fluorides, should consider the practicability and economic feasibility of adjusting the concentration to optimal levels. This adjustment should be in accord with climatic factors and a constant chemical control should be maintained. With proper safeguards, this procedure appears to be harmless. However, it should be conducted under expert dental and engineer-

ing supervision by the State Board of Health. It should not be undertaken unless this can be provided. How much reduction in the prevalence of caries will actually be realized in a particular community will vary according to local conditions. The procedure will supplement but not supplant other dental health measures. About one-half of the population of this Country is living in small villages and rural areas and will not benefit by fluoridation of public water supplies. Other provisions for preventing dental caries in this fraction of the population should be continued and developed.

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Health Officers Ask Border Program

The following resolution relating to health problems at the border of the United States and Mexico was adopted by the California Conference of Local Health Officers at its recent annual meeting in Stockton.

"Resolved, That the California Conference of Local Health Officers encourages and requests joint action by the Pan American Sanitary Bureau, the World Health Organization, the United States Public Health Service, the State Health Departments of those states bordering on Mexico, and these states' representatives in the Congress of the United States, to establish on a permanent basis adequate facilities for the control of tuberculosis and other health problems at the border of the United States and Mexico."

Fluoridation Viewed as Safe by A. M. A. Councils

The American Medical Association, in a report prepared jointly by the Council on Pharmacy and Chemistry and the Council on Foods and Nutrition, has issued a statement of opinion endorsing fluoridation of water supplies as a safe procedure in reducing the incidence of dental caries. The statement, which appears in the December 1st issue of the Journal of the American Medical Association (page 1359), is as follows:

"The Council on Pharmacy and Chemistry and the Council on Foods and Nutrition have been requested to state their opinion regarding the safety of fluoridation of water supplies, a procedure which has now been adopted by more than 140 cities.

"The Councils are unaware of any evidence that fluoridation of community water supplies up to a concentration of one part per million would lead to structural changes in the bones or to an increase in the incidence of fractures. The only difficulty so far revealed is a possible increase in mottling of the tooth enamel. The available evidence based on thousands of observations indicates that the incidence of mottling of the enamel in children who drink water containing fluoride up to a concentration of one part in a million is minimal and detectable only by careful dental examination. It occurs only in a small percentage of children and is so slight as not to present a problem from the point of view of appearance or strength of the teeth. Evidence of toxicity other than the effect on enamel has not been reported in communities where the water supply has several times this concentration. After considering the evidence available at this time, the Councils believe that the use of drinking water containing up to one part per million of fluoride is safe. However, the use of products which are naturally high in fluoride content, such as bone meal tablets, or of lozenges, dentifrices, or chewing gum, to which fluoride has been added, should be avoided where the drinking water has been fluoridated. In places where children are subjected to warm temperatures and consequently drink large amounts of water, a lower concentration of fluoride may be necessary to avoid mottling of the teeth."

Greens Cause Botulism Deaths

Home-canned greens, identified as *Portulaca oleracea*, have been incriminated as the food which caused three deaths from botulism in Los Angeles last month. Type A toxin was demonstrated by animal inoculation. A Los Angeles husband and wife and a guest at a pre-Thanksgiving Day meal died from the poisoning.

VD Treatment for Nonresidents

A resolution recommending that local health department facilities be made available for the diagnosis of venereal disease and the treatment of infectious cases regardless of the residence status of the persons who ask for such service was adopted by the California Conference of Local Health Officers at its annual meeting in Stockton, November 16th-17th. The need for removing restrictive residential requirements by local health departments was related to the principle stated in the resolution that "infectious diseases do not respect political boundaries, and that the individual infectious with venereal disease constitutes a hazard to the public health of an emergency nature as long as the disease is undiagnosed and untreated."

Water Laboratory Permit Program Inaugurated in State

Investigations of laboratories seeking permits to do chemical and bacteriological testing of water are now being made under regulations newly adopted by the State Board of Public Health.

The regulations were developed as a result of recent legislative amendments which require all domestic water systems in California to operate under permit. Purity and quality of water must be certified by laboratory analysis in order for a permit to be granted. In the past, a few labs known to be reliable for other work were approved as competent to perform tests on water. Under the new regulations it became possible and necessary for the department to organize specific procedures for investigating any laboratory and judging its eligibility for a water-testing permit by objective standards and criteria. Investigations of this type are now under way, with applications for permits being received by the Division of Laboratories in growing number.

In order that regulations for the permit program should be professionally sound and acceptable, recommendations were made to the state board only after the department had held a series of discussions with many laboratory operators and a special committee designated by the California Section of the American Water Works Association.

The official stamp on alcoholism as a public health problem has come at last through the action of the World Health Organization in its inclusion of alcoholism in the program of the W. H. O. by appointment of an Alcoholism Subcommittee of the Expert Committee on Mental Health of the W. H. O.—*W. H. O. newsletter, March, 1951.*

Oakland City Health Officer Takes W. H. O. Assignment

Stanford F. Farnsworth, M.D., Oakland City Health Officer for the past eight years, has resigned to accept an appointment with the World Health Organization in South America. He will leave February 1st to become a zone representative for W. H. O. under a new



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organizational setup being established by W. H. O. within the framework of the Pan American Sanitary Bureau.

The announcement of Dr. Farnsworth's appointment was made by Dr. Fred Soper, W. H. O. director for the Region of the Americas. Earlier this year Dr.

Farnsworth spent three months in Egypt, serving as a public health consultant to the Egyptian government in a project conducted under W. H. O. auspices.

Dr. Farnsworth became Oakland's health officer on July 16, 1943, following a year as Alameda County Health Officer. In 1940-1941 he was with the Farm Security Administration, assigned to the Eleven Western States. From 1935 to 1940 he served as Coordinating Officer of the California State Department of Public Health, during which time he was instrumental in establishing the Division of Local Health Services. In 1934 and 1935 he was with the U. S. Public Health Service.

Dr. Farnsworth is a graduate of the University of California. He obtained his medical degree from the College of Medical Evangelists, and his Master of Public Health degree from Johns Hopkins.

His work with the California Conference of Local Health Officers has included presidency of that organization in 1948-1949, chairmanship during the past year of the Study Committee on General Services, membership on the Conference's Committee on Administrative Practices, and for the past two years membership on the joint committee with the California Medical Association.

Dr. Farnsworth is a member and Fellow of the American Public Health Association. Three years ago he was chairman of the Health Officers Section and is currently serving on the APHA's Committee on Administrative Practice.

Rat-borne Typhus Outbreak Reported in Los Angeles

A localized outbreak of endemic typhus fever has occurred in the residential district of Altadena in Los Angeles County, in an area where no previous cases had been reported. As of December 15th, two cases had been confirmed by laboratory tests, and tests on another dozen suspected cases were being run at the State Virus Laboratory in Berkeley.

The outbreak is believed to have been associated with the demolition of a rat-infested barn in the rear of the block where the cases later appeared. The dislodged rats apparently invaded the residential block to escape the coming cold weather.

With discovery of the first suspected case, county and state public health workers surveyed the area, discovering other suspected cases. At the request of the Los Angeles County Health Department, a state mobile laboratory was dispatched to the area so that on-the-spot examinations could be made for fleas on household pets and trapped rats.

California Local Health Departments Cited in Medical Case Report

In a recently published report on "General Medical Care Programs in Local Health Departments" in the United States three California health department programs are described.

Sacramento City Health Department was cited because it is responsible for the city's emergency hospital; San Francisco Department of Public Health because it administers the municipal hospital system including the San Francisco Hospital, the Laguna Honda Home for the Aged, the Emergency Hospitals, and the Hassler Health Home, a tuberculosis sanitarium; and the San Mateo County Department of Public Health and Welfare because of its combination of all public health, hospital, and welfare services in a single department.

Forty programs throughout the United States are described in the study, a summary of findings is given and a discussion is included according to the author. Only about 5 percent of all full-time health departments have responsibilities for administering general medical services of varied scope and character and "the population covered by these health units constitutes over 10 percent of the more than 118 million persons under the jurisdiction of full-time local health departments in the Country." These figures are based on unpublished data of the Bureau of State Services, Public Health Service.

One of their conclusions is that despite the limitations inherent in providing care for welfare recipients and medically indigent persons "the health officers involved have taken a bold experimental approach in utilizing new patterns of medical service. They have placed a great deal of emphasis on improving the quality of care and on improving the therapeutic services with the principles and practices of preventive medicine."

The report was made by Milton Terris, M.D., and Nathan A. Kramer to the Subcommittee on Medical Care, Committee on Administrative Practice, American Public Health Association. Copies may be obtained from that association at 1790 Broadway, New York, for 50 cents each.

During one year a person in the U. S. eating an average amount of beef consumes 4.7 ounces of the trace element, potassium—*Food and Nutrition News*.

Review of Reported Communicable Disease Morbidity: November, 1951

Diseases With Incidence Exceeding the Five-year Median

Diseases	Nov., 1951	Nov., 1950	Nov., 1949	5-Year Median
Amebiasis	43	39	29	29
Chickenpox	1,784	2,062	1,732	1,732
Encephalitis	15	54	9	7
German measles	218	214	199	199
Hepatitis, infectious	42	34	34	19
Malaria	4	—	1	2
Meningitis, meningococcal	34	16	24	21
Pertussis	307	263	462	263
Poliomyelitis	409	374	333	333
Salmonella infections	39	27	38	16
Shigella infections	89	81	79	47
Streptococcal infections, Respiratory	604	552	503	522
Tetanus	7	5	3	3
Typhoid fever	8	5	7	7

Diseases Below the Five-year Median

Diseases	Nov., 1951	Nov., 1950	Nov., 1949	5-Year Median
Diphtheria	4	17	56	49
Food poisoning	87	37	202	150
Influenza	28	38	39	38
Measles	474	870	269	504
Mumps	1,297	1,318	2,350	1,318

Public Health Nutrition Program Functions Outlined

At the recent meeting of the Conference of Local Health Officers in Stockton the conference approved as a guide for local and state program directors the report of the subcommittee of the General Services Committee which outlined the functions of a public health nutrition program as follows:

1. To assist in the control and prevention of nutritional deficiencies among those groups of individuals who are particularly susceptible to nutritional impairment.
2. To provide a nutrition education program which offers a positive approach to the maintenance of health and the prevention of some of the major diseases of middle and later life.
3. To promote program for adequate food facilities in industry, in institutions caring for patients with acute disease or a chronic condition and in school lunch programs.
4. To provide specialized knowledge in the field of nutrition for purposes of consultation.

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